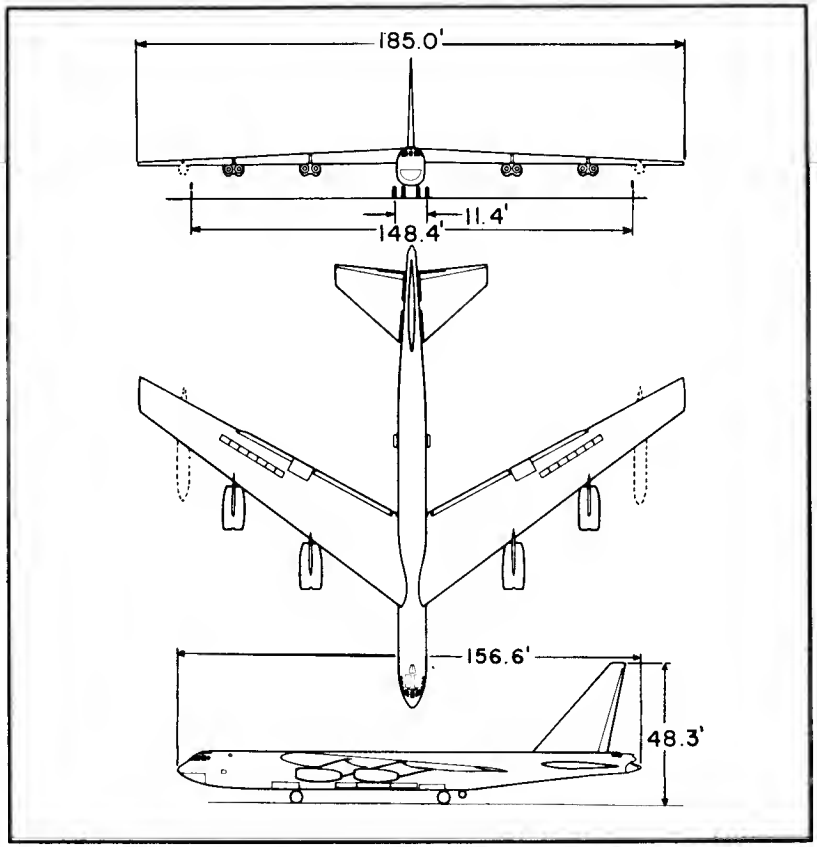
Standard Aircraft Characteristics

BY AUTHORITY OF
THE SECRETARY
OF THE AIR FORCE

B-52E

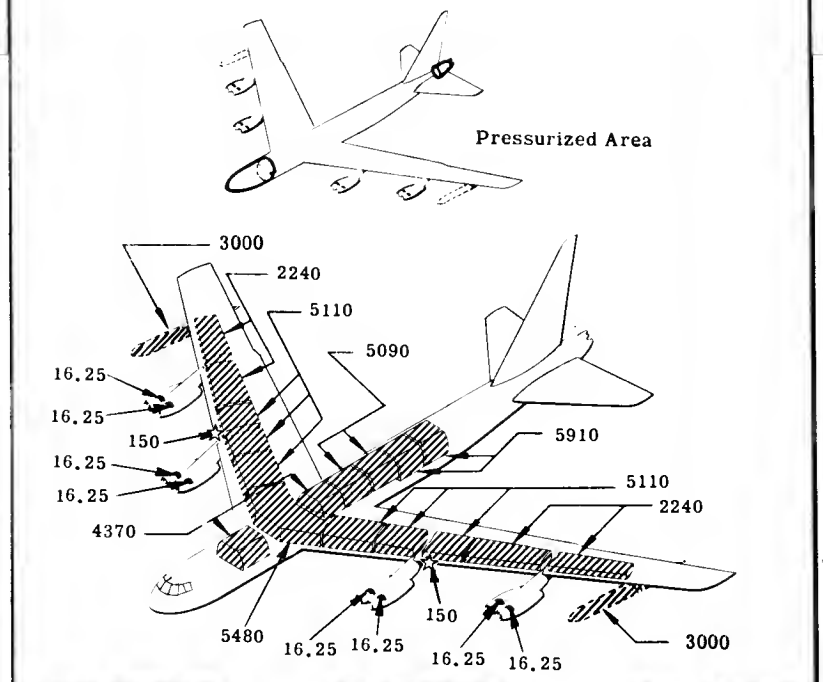
STRATOFORTRESS
Boeing

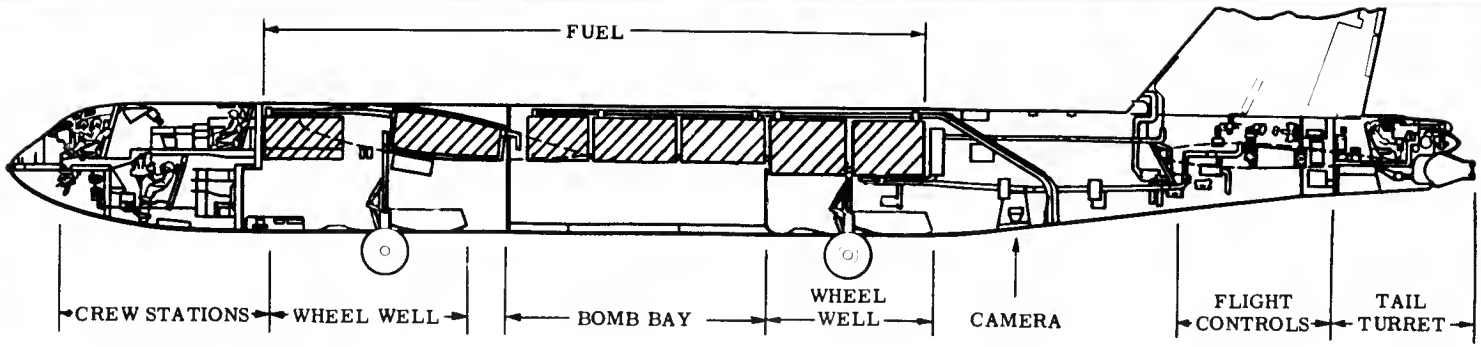
EIGHT J57-P-19W, or -29WA
PRATT & WHITNEY



Wing Area . . . . . 4000 sq ft
Aspect Ratio 8.55

Wing Section (root) . BAC 233 29.31
(tip) . . BAC 236 9.56
M.A.C. . . . . 275.5"





POWER PLANT

Nr & Model	(8) J57-P-19W or -29WA
Mfr	Pratt & Whitney
Engine Spec Nr	A-1649G
Type	Axial
Length	157.7"
Diameter	40.5"
Weight (dry)	(J57-P-19W)*3970 lb
Tail Pipe	Fixed Area
Augmentation	Water

Note: At present there are no requirements for ATO
*J57-P-29WA engine . . . . 4150 lb

ENGINE RATINGS

S.L. Static	LB	**RPM	MIN
Max:	*12,1000	6450/9900	5
Mil:	10,500	6150/9900	30
Nor:	9000	5900/9650	Cont

*Wet

**First figure represents low pressure spool; second figure represents high pressure spool.

Mission and Description

Navy Equivalent: None Mfr's Model: 464-259

The principal mission of the B-52E aircraft is the destruction of surface objects.

The normal crew of six consists of pilot, co-pilot, (2) bombardier-navigators, ECM operator and tail gunner.

Automatic cabin pressurization, heating and ventilation are provided for crew comfort during normal and combat operation.

Ejection seats for emergency escape are afforded the crew except for the tail gunner who bails out after jettisoning the tail section containing the gun turret.

Flight control, throughout the speed range from limit dive speed to landing speed is accomplished by use of spoilers and ailerons on the wing; elevators on an all-movable horizontal tail; and a rudder on a fixed vertical tail surface. The spoilers also function as air hrakes used in landing.

Air is bled off the engines for thermal anti-icing of the wing and tail surface leading edges.

Other features are single-point ground and air refueling, braking parachute for decreasing landing roll distance, and a crosswind landing gear to aid in crosswind take-off and landing and a liquio oxygen system. The airplane utilizes the A-14 Auto-Pilot and the N-1 Compass.

The B-52E differs from the B-52D by the installation of the AN/ASB-4 Bombing Navigational System in place of the MA-6.

Development

Design Initiated	May 54
First flight	Nov 57
First delivery to SAC	Dec 57

WEIGHTS

Loading	Lb	L.F.
Empty	163,752	
Basic	167,166	
Design	†453,000	2.0
Combat	*282,600	2.4
Max T.O.	**450,000	2.0
Max In-Flt	‡450,000	2.0
Max Land	270,000	

(C) Calculated
* For Basic Mission
** Excludes 2500 lb water
† Max taxi wt, 10,000 lb bomb
‡ Limited by structure

FUEL

Location	Nr Tanks	Gal
Wg, outbd	2	4480
Wg, ctr	1	5480
Wg, inbd*	4	10,220
Fus, fwd*	2	4370
Fus, ctr*	1	5090
Fus, aft*	1	5910
Wg, drop	2	6000
	Total	41,550
Grade		JP-4
Specification		MIL-F-5624
Nacelle	8	(tot) 130
Specification		MIL-L-7808A
Wg, L.E.	2	300

OIL
WATER
*Self-Sealing

DIMENSIONS

Wing	
Span	165.0'
Dihedral (chord plane)	2°30'
Incidence (root)	6°
Sweepback (LE)	36°58'
Length	156.6'
Height (overall)	48.3'
Height (fin folded)	20.9'
Tread (outrigger)	148.4'
Tread (main gear)	11.4'

BOMBS

Nr	Class (lb)
New Series	
27 (Family of Clusters)	1000
Special Weapons	
2	MK21
2	MK15

Note: Structural provisions for 50,000 lb bomb; space and structural provisions for GAM-63

GUNS

Nr	Type	Size	Rds ea	Loc
4	M-3	.50	600	Tail, tur

CAMERAS

Nr	Type	Lens
1	K-38	36"
1	K-22	6"
	or	
1	K-17D	6"
1	O-15 Radar Recording	

ELECTRONICS

UHF Command	AN/ARC-34
Liaison	AN/ARC-21X
IFF	AN/APX-25
Radar Beacon	AN/APN-69
ECM Trans (7)	AN/ALT-6
ECM Trans (2)	AN/ALT-7
ECM Receiver (1)	AN/APR-9
Interphone	AN/AIC-10
Bombing Sys	AN/ASB-4
Nav Recv'r	AN/ARN-14
Fire Control Sys	MD-1

See page 6 for additional equipment.

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Loading and Performance—Typical Mission

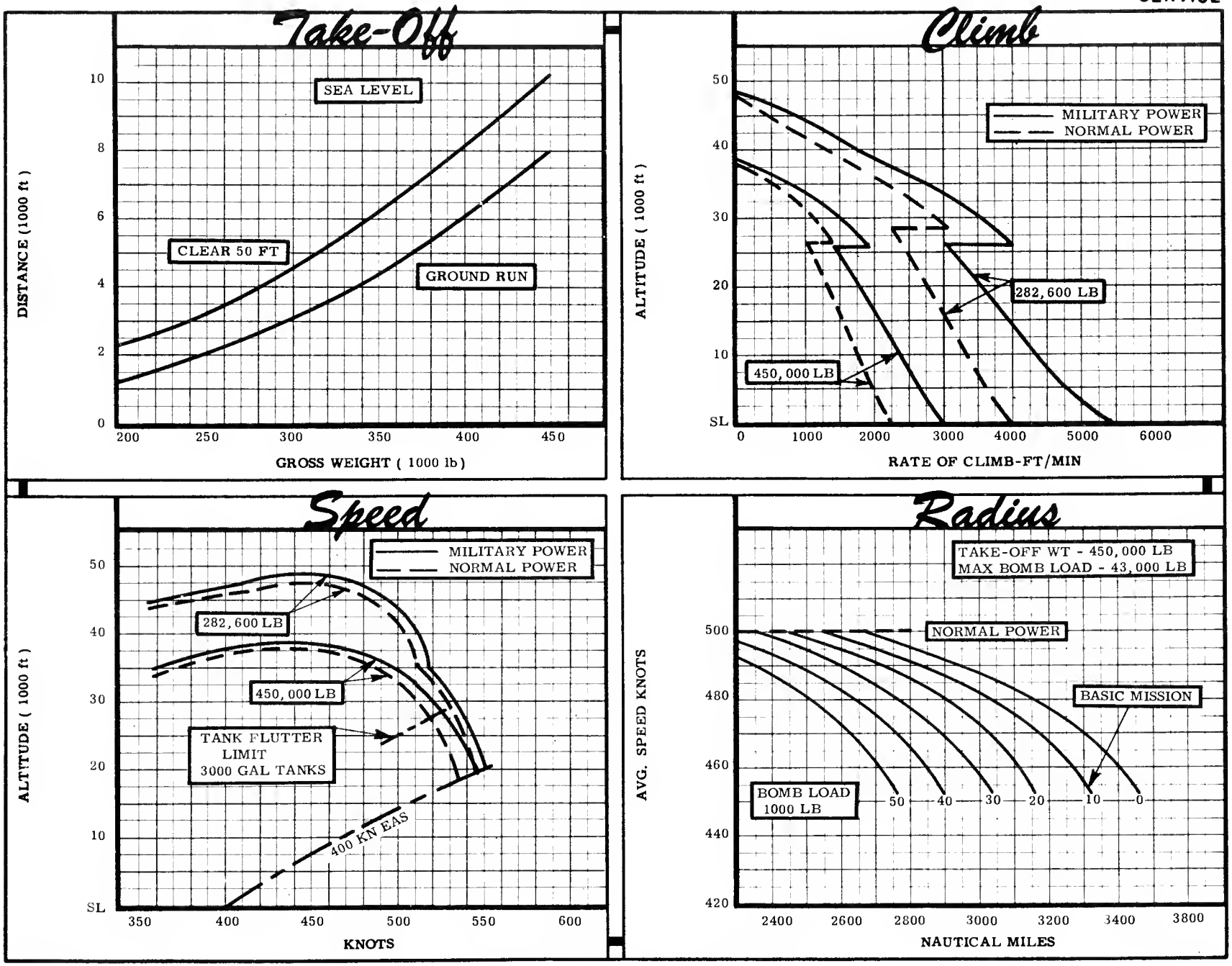
CONDITIONS		BASIC MISSION	DESIGN MISSION	MAX BOMB MISSION	FERRY RANGE
		I	II	III	IV
TAKE-OFF WEIGHT ⑦	(lb)	450,000	450,000	450,000	442,165 ⑧
Fuel at 6.5 lb/gal (grade JP-4)	(lb)	267,910	269,310	234,099	270,075 ⑧
Payloads (Bombs)	(lb)	10,000	8600	43,000	None
Wing loading	(lb/sq ft)	112.5	112.5	112.5	110.5
Stall speed (power off) ⑨	(kn)	147	147	147	146
Take-off ground run at SL ①	(ft)	8000	8000	8000	7650
Take-off to clear 50 ft ①	(ft)	10,300	10,300	10,300	9920
Rate of climb at SL ③	(fpm)	2225	2225	2225	2270
Rate of climb at SL (one engine out) ②	(fpm)	2440	2440	2440	2490
Time: SL to 20,000 ft ③	(min)	10.8	10.8	10.8	10.5
Time: SL to 30,000 ft ③	(min)	18.0	18.0	18,0	17.6
Service ceiling (100 fpm) ③	(ft)	37,550	37,550	37,550	37,900
Service ceiling (one engine out) ②	(ft)	37,050	37,050	37,050	37,450
COMBAT RANGE ④	(n. mi)	———	———	———	6842
COMBAT RADIUS ④	(n. mi)	3320	3340	2850	———
Average cruise speed	(kn)	453	453	453	453
Initial cruising altitude	(ft)	33,500	33,500	33,500	33,900
Target speed ③	(kn)	476	476	476	———
Target altitude	(ft)	45,050	45,100	44,000	———
Final cruising altitude	(ft)	50,850	50,850	50,950	50,850
Total mission time	(hr)	14.73	14.82	12.64	15.14
COMBAT WEIGHT	(lb)	282,600	283,400	265,500	187,760
Combat altitude	(ft)	45,050	45,100	44,000	50,850
Combat speed ②	(kn)	495	495	505	507
Combat climb ②	(fpm)	785	775	1215	1230
Combat ceiling (500 fpm) ②	(ft)	46,350	46,250	47,550	54,750
Service ceiling (100 fpm) ③	(ft)	46,950	46,900	48,150	55,600
Service ceiling (one engine out) ③	(ft)	45,300	45,250	46,550	53,550
Max rate of climb at SL ②	(fpm)	5310	5300	5720	8270
Max speed at optimum alt ② ⑤	(kn/ft)	551/20,200	551/20,200	552/20,350	553/20,500
Basic speed at 35,000 ft ②	(kn)	520	520	521	525
LANDING WEIGHT	(lb)	187,600	187,700	186,900	187,760
Ground roll at SL ⑩	(ft)	2250	2250	2230	2250
Ground roll (auxiliary brake) ⑥ ⑩	(ft)	2020	2020	2000	2020
Total from 50 ft ⑩	(ft)	3870	3870	3850	3880
Total from 50 ft (auxiliary brake) ⑥ ⑩	(ft)	3620	3620	3600	3630

NOTES

① Take-off power
② Military power
③ Normal power
④ Detailed description of RADIUS and RANGE missions given on page 6.
⑤ Limited by structure
⑥ With drag chute
⑦ Excludes 2500 lb water
⑧ Limited by fuel capacity
⑨ Initial buffet, flaps down, S.L.
⑩ Braking force limited to 40,000 lb

PERFORMANCE BASIS:
(a) Data source: Flight test
(b) Performance is based on powers shown on page 3.

SERVICE



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B-52E

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NOTES

FORMULA: RADIUS MISSIONS I, II & III

Take-off and climb on course to optimum cruise altitude at normal power. Cruise out at long range speed, increasing altitude with decreasing weight; external tanks are dropped when empty. Climb so as to reach cruise ceiling 15 minutes from target. Run in to target at normal power, drop bombs, conduct 2 minutes evasive action and 8 minutes escape at normal power. Cruise back to base at long range speed and optimum altitudes; as an alternate, a 45,000 foot ceiling may be maintained on the return leg with no radius penalty. Range-free allowances are fuel for 5 minutes at normal power for take-off, fuel for 2 minutes at normal power for evasive action, and fuel for 30 minutes maximum endurance at sea level plus 5% of the initial fuel load for landing reserve.

FORMULA: RANGE MISSION IV

Take-off and climb on course to optimum cruise altitude at normal power. Cruise out at long range speed, increasing altitude with decreasing weight; external tanks are dropped when empty. Land at remote base with only reserve fuel remaining. Range-free allowances are fuel for 5 minutes at normal power for take-off, and fuel for 30 minutes maximum endurance at sea level plus 5% of the initial fuel load for landing reserve.

GENERAL DATA:

(a) The landing reserve for the Basic Mission is equivalent to 809 nautical miles range at optimum speed and altitude.

(b) The following electronic equipment is supplemental to that shown under "Electronics" on page 3:

Glide Path Receiver	(1) AN/ARN-18
Marker Beacon	(1) AN/ARN-12
Early Warning	(1) AN/APS-54
Chaff Dispenser	(1) AN/ALE-1

(c) O.W.E. increases approximately 2000 lbs on B-52 airplanes utilizing the J57-P-29WA engines resulting in a range decrease for a given T.O. Weight.

PERFORMANCE REFERENCE:

Boeing document D-15134B, "Substantiation Data Report - Models B-52B (J57-P-19W engines), B-52C and B-52D Standard Aircraft Characteristics Charts", dated 14 May 1957.

REVISION BASIS:

To reflect change in security classification.